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ORIGINAL ARTICLES.

RESECTION OF THE STERNUM FOR TUMORS, WITH THE REPORT OF TWO CASES AND A TABLE OF SEVENTEEN PREVIOUSLY REPORTED CASES.*

W. W. KEEN, M.D., LL.D.,† PHILADELPHIA.

CASE I.—*Resection of the Manubrium, Inner Third of the Left Clavicle and Lower Third of the Left Sterno-Cleido-Mastoid for Sarcoma.*

Mrs. F. ———, twenty-eight years old, was admitted to Jefferson Medical College Hospital, November 18, 1895. About nine months before she had noticed a spot of tenderness at the right sterno-clavicular articulation, over an area about two inches in diameter. This disappeared in about a week. A month later a similar spot appeared at a corresponding point on the left side. This swelling developed gradually into a moderate tumor, which became tender and occasionally painful. When the patient came under our observation it covered the end of the clavicle and the upper left portion of the manubrium, and there were two small nodules over the lower end of the sterno-cleido-mastoid. (Fig. I.)

A careful investigation of the woman's history led me to disbelieve that the swelling was possibly syphilitic. This view was further supported by the fact that before her entrance into the hospital a thorough course of anti-syphilitic treatment had resulted in no improvement. The diagnosis, therefore, was made of a sarcoma.

Operation, November 20, 1895.—The only question in my mind was whether there were such adhesions behind the bone as to prevent the removal of the manubrium. This was the first point to determine. I therefore first made a semicircular incision, beginning at the right sterno-cleido-mastoid insertion into the clavicle, arching up into the neck, and ending below the middle of the left clavicle. By blunt dissection I then freed the tissues at the inner border of the left sterno-mastoid, inserted my finger well behind this muscle, and worked my way downward behind the manubrium sufficiently to determine that there were no such adhesions as to prevent the resection that I contemplated. (Fig. II.) I then divided the sterno-mastoid at the junction of its lower and middle thirds, and removed the lower third of the muscle, together with all the diseased tissues from in front of the sternum and clavicle. (Fig. IIc.)

*Read before the Philadelphia County Medical Society, February 24, 1897.

† Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia.

This laid bare the clavicle and the sternum, both of which I found were more or less worm-eaten by disease. Carefully loosening the tissues behind the clavicle, I then sawed this bone at the junction of its inner and middle thirds, and removed the inner third of the clavicle entire. (Fig. IIa.) I next separated the cartilage of the first rib from the parts behind it, and removed one inch of the inner end of the rib. The manubrium was then free, both above and to the left, and I was enabled gradually to insinuate my finger behind the manubrium, and separate it from the tissues of the mediastinum. A strong pair of bone-pliers was then passed behind the manubrium, and it was divided just to the left of its right border, and then horizontally just above the joint between the manubrium and the gladiolus. (Fig. IIb.) None of the vessels at the base of the neck was laid bare, excepting the left jugular, but the pulsation of the arch of the aorta was perfectly perceptible. Fig. III shows in a diagrammatic way the parts removed. A few small vessels were cut and tied. The skin was undermined, both above and below, and approximated as closely as possible, but a considerable gap was left in the center, between the two flaps. Moreover, the flaps did not rest on the soft parts behind them. In dressing the wound, therefore, I endeavored, by means of compresses and a bandage, to bring the edges in contact.

The patient stood the operation very well, but little blood being lost. The tension on the stitches was very great, so that in a few days they ulcerated through to a considerable degree, and caused both redness and suppuration. By the third day the temperature had risen to 102.5°. In the considerable cavity corresponding to the upper portion of the mediastinum pus accumulated, and there was much danger of its burrowing downward into the anterior mediastinum and, as I especially feared, towards the apex of the left lung. Accordingly, I drained the cavity most

FIG. I.

Sarcoma of Manubrium Left Clavicle and Sterno-cleido-mastoid.

satisfactorily by Cathcart's apparatus as modified by myself.[2] By the ninth day the temperature had fallen to the normal, and, with slight fluctuations within a very narrow range, remained at this point till the patient was discharged January 26, 1896, with a small ulcer yet unhealed. Soon afterward the entire surface healed.

Kyle, who reported as follows:—"Sections of tumor of the sterno-mastoid muscle showed, in certain areas, round-cell infiltration, with vessels showing embryonic walls. Certain areas showed adult fully developed structure, but there was sufficient characteristic structure to warrant the diagnosis of sarcoma. Sections of the

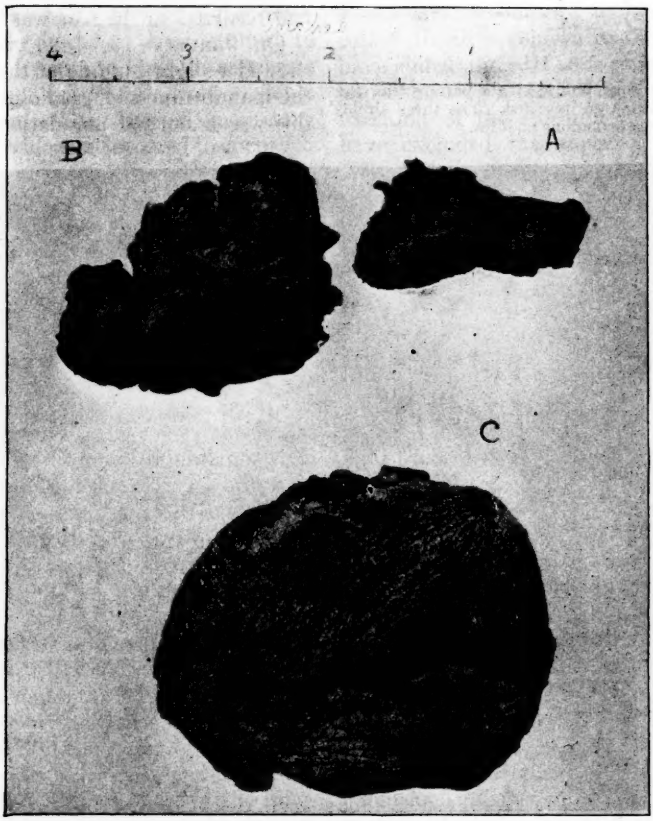

FIG. II.

The parts resected (except the first rib):—A. The Clavicle. B. The Manubrium. C. The Tumor in front of the Bones and the Sterno-cleido. (Four pins to hold it when photographed, looking like depressed nipples, as seen at the four corners.)

(Fig. IV.) I have the pleasure of showing the patient to you to-night. You will observe a slight tendency to keloid in the scar; otherwise there is nothing abnormal. The pulsation of the aorta and innominate can be both seen and felt. Her general health is excellent. No return has occurred after more than fifteen months.

The specimens were given to Dr. D. B. rib showed round-cell infiltration, but not in itself characteristic of sarcoma. Sections of the manubrium were more marked, it being typical round-cell (small) sarcoma. Certain minute areas showed cystic degeneration."

CASE II.—*Carcinoma of the Breast; Secondary Carcinoma of the Sternum at the Junction of the Manubrium and Gladiolus. Successful Removal of Both Breasts; Resection of Parts of the Manubrium and*

[2] Annals of Surgery, February, 1897.

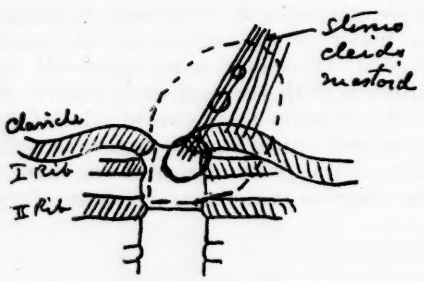

FIG. III.

Diagram of the Resection. All the parts within the interrupted line were resected. The three circles represent the sarcomatous nodules.

just beginning to retract. The axillary glands could be indistinctly felt.

Operation March 1, 1892.—The breast and several enlarged axillary glands and the fascia over the pectoral muscles were removed. The muscles themselves did not seem to be involved and were left. The patient made a prompt recovery.

On May 20, 1893, a small nodule that had recurred in the scar was excised.

On January 19, 1894, the sternum showed a slight bulging at the junction of the manubrium and gladiolus. Whether this was a normal angulation which had

FIG. IV.

The Present Appearance of the Patient.

Gladiolus; Recovery. Death from Recurrence.

Mrs. B., 44 years years old, was first seen with Dr. J. H. Beck, of Philadelphia, February 17, 1892. She had first noticed a tumor in the left breast during the preceding summer. This had given her only moderate pain, but it had grown of late rather rapidly. Examination showed a tumor two and a-half inches in diameter in the upper outer quadrant, the nipple escaped my notice, or an infection of the bone, I was uncertain.

On February 19, 1894, the thickening of the sternum had distinctly increased, and I also discovered a small nodule in the right breast at the inner border. No glands were appreciable in the right axilla.

Second Operation, March 22, 1894.—Within the preceding month the sternal tumor had increased very much in size, and the woman finally consented to an

operation, which I performed at this time, with the assistance of Dr. J. William White. There being two small nodules in the skin over the sternal swelling, an elliptical incision was made, including both of these nodules. Four or five deeper nodules were then perceived which had not been noticed through the skin. As the sternum and also the cartilages of the second and third ribs, as well as the intercostal muscle between them, seemed to be involved, I removed both the cartilages and also the intercostal tissues down to the pleura. The internal mammary artery was divided and secured by a curved needle passing through the thinned wall of the pleural cavity. A considerable portion (about 1x1½ inches) of both the manubrium and the gladiolus was then removed by the double rongeur forceps until apparently healthy bone was reached. The right breast was then removed, together with a layer of the pectoral muscle and all of its fascia, and the right axilla cleaned out. At the end of the operation the woman was in a very precarious condition, but under stimulants and strychnin she revived. Her highest temperature only once exceeded 101°. During April her temperature again rose and remained for some time above and below 100°, but she finally made a good recovery. While I was away on my summer holiday I learned that the disease returned, and that she died in the following August.

Dr. Kyle made the following report on the specimen: "Sections showed all the tissue to be infiltrated (malignant). The periosteum was thickened and cancerous. Also there was a small piece of the intercostal tissue extending down to the pleura, which, while not so much thickened, showed evidence of malignancy. The section of the rib or cartilage showed infiltration only on the upper side, which extended to the inferior margin. The central portion showed no evidence of malignancy."

RESECTION OF THE STERNUM

for any cause, but especially for tumors, is rare. In 1859 Heyfelder[3] was able to collect only twenty-five cases of resection for all causes from the time of Galen downward, and even of these six were superficial resections; and Steinheil[4] states that, apart from the cases very briefly reported by Otis in the History of our Civil War, there were only thirty-six authentic cases reported. Mynter later, in 1891,[5] was able to find only two cases of resection for tumors besides his own. From various sources I have been able to collect in all seventeen cases, to which I have added the two cases reported in this paper, making a total of nineteen cases of resection of the sternum for tumors. I have excluded the superficial resections for exostosis, etc.; such as Weinlechner reports,[6] in which a colloid sarcoma of the breast was removed, together with an ossifying enchondroma of the gladiolus, as only the superficial layers of the bone were resected. I have restricted myself to those cases in which the entire thickness of the bone was removed, in seventeen out of the nineteen cases for tumor of the sternum, and in two cases for the removal of retro-sternal fibroids.

More or less of the sternum has been removed for various purposes:

(1.) To obtain access to the great vessels in order to ligate them. Bardenheuer[7] has advocated resection of the manubrium in cases in which it is impossible to ligate the subclavian or innominate artery or veins at the usual points. This seems, I confess, a very heroic procedure. I do not know of any recorded case in which it has been necessary.

(2.) For fractures, and especially gunshot fracture of the sternum. The most extensive statistics are those of Otis,[8] who records fifty-one cases, with a mortality of 18, or 35.3 per cent. He illustrates with an excellent chromo-lithograph[9] a frightful wound of the sternum from canister, from which the patient recovered and lived many years. Through the wound the pulsation of the aorta could be plainly perceived. Otis refers also[10] to

[3] Lehrbuch der Resectionen, p. 304.

[4] Centralblatt f. Chirurgie, May 25, 1889.
[5] Annals of Surgery, XIII., 966.
[6] Bericht der K. K. Kaiseranstalt Rudolph Stiftung, 1871, Wien, 1873, p. 24.
[7] Deutsche medicin. Wochenschr., 1885, II., 688.
[8] Medical and Surgical History of the War of the Rebellion, Surgical Volume, Part 1, pp. 486 and 571.
[9] Op. Cit. Opposite page 486.
[10] Op. Cit., p. 571.

the case of the son of the Viscount Montgomery, who was injured by a severe fall, with fracture of the ribs on the left side. An immense abscess formed, and a large part of the chest-wall sloughed, so that the heart itself was exposed. The case is the more memorable from the fact that the young man was shown to Charles II. by Harvey, in order that the king could perceive the movements of the heart.

(3.) The sternum may be resected for caries as a result of tuberculous osteomyelitis, and occasionally, as in one of my own cases (not here reported), from typhoid osteomyelitis.

(4.) The sternum has been resected for tuberculous fungous inflammation of the articulation between the manubrium and the gladiolus. Yvert[11] reports one case and quotes a second.

(5.) It is sometimes necessary to resect the sternum on account of retro-sternal abscesses. These may arise in the neck, from the thyroid gland, laryngeal cartilages, etc., and work their way downwards to the anterior mediastinum behind the sternum. Sometimes they originate in inflammation of the sterno-clavicular articulation, as pointed out by Bardenheuer, the abscess rupturing posteriorly toward the mediastinum instead of anteriorly. Occasionally such an abscess originates from tuberculous or other inflammation of the bone itself, producing an abscess of the anterior mediastinum.

(6.) The resection is necessitated by tumors. These may be either retro-sternal tumors, such as fibromata, dermoids, or other forms of tumor; or they may arise in the sternum itself or at the inner end of the clavicle, and later may invade the sternum.

The cause of tumors of the sternum is usually unascertainable. Sometimes they are due to violence, especially if they be sarcomatous, as in one instance (Case XIII) in which the growth arose, apparently, from the injury done by a companion seizing the elbows of the patient and quickly approximating them behind the back. In another case, not treated by operation, it was ascribed to a heavy weight that struck the bone; in a third (Case XVII), to injury from a broom-handle.

Such tumors may be either primary or, occasionally, secondary. In the latter case, they are usually secondary to carcinoma of the breast. I have now examined a great many cases, with a view of determining whether Mr. Snow's assertion is correct, that in most cases of carcinoma of the breast the sternum is tender at the junction of the manubrium and gladiolus from carcinomatous invasion of the bone. I confess that I have only very rarely found the bone involved. The second case related in this paper is an instance of this. I have also seen this sign in one case of atrophic scirrhus, in which no operation was performed. Most cases of carcinoma of the breast, however, seem to be free from such invasion.

The varieties of the tumors are as follows:

Of various forms of sarcoma, . .	9
Chondroma, ...	2
Secondary carcinoma, gumma, fibroid, of each one, ...	3
Retro-sternal fibroids requiring resection, ...	2
Variety not stated, ...	3
Total, ...	19

Almost one-half, therefore, of such tumors are usually, as one would expect, sarcomata. Occasionally the tumor extends into the muscles, as in the first of my own cases, in which there were nodules in the sterno-cleido-mastoid, and also in Case XIII of the table, in which recurrent chondromata appeared in the great pectoral.

Fortunately, adhesions to the retro-sternal tissues, and especially to the pleura and the pericardium, do not take place until late. These tissues are usually pushed before the tumor, and the tumor, therefore, if the operation be not delayed too long, may be separated from them with ease. In three instances (Cases II, III, IV) the adhesions were so intimate that the pleura or the pericardium, or even all three, were unavoidably torn during the operation. The effect of such a tear is much slighter than one would suppose. Ordinarily, it is believed that the lung

[11] Revue de Chirurgie, 1893, XIII, p. 32.

collapses. This is true, to some extent, but in the case above alluded to, in which I resected part of the sternum and some ribs on account of typhoid osteomyelitis, I unavoidably tore a hole in the pleura, which, at the end of the operation, was as large as a silver dollar, and not the least collapse of the lung took place. It rose and fell with every respiration, protruding from the wound during inspiration and receding during expiration. In Kœnig's remarkable case (No. II of the table), in which both pleuræ and the pericardium were torn, very little respiratory difficulty followed, and the only disturbance of function was a marked increase in the frequency of the pulse. Tearing is not, therefore, always the formidable accident that it has ordinarily been deemed.

The portions of the sternum involved were as follows:

Manubrium, ...	5 times
Gladiolus, ...	9 "
Clavicle, including also the manubrium, ...	1 "
Retro-sternal tumors, . .	2 "

The portion involved in the resection was the manubrium, 14 times; the gladiolus, 12 times. The total (26) exceeds the number of cases (19), as in some of them the resection involved parts of both the manubrium and the gladiolus. No instance of tumor involving the ensiform cartilage was found, but Ashhurst[12] refers to the two well-known cases of Linoli and Rinonapoli, as well as a third case of his own, in which the ensiform was removed on account of the uncontrollable vomiting apparently due to backward pressure of this part of the bone.

Women seem to be more subject to the tumors under consideration than men, as there are ten women and five men mentioned in my table. In the other cases the sex was not given. Age seems to exert little, if any, influence, as

Of 20 years and under there were	2 cases
from 21 to 30	4 "
" 31 to 40	1 "
" 41 to 50	3 "
over 50	2 "
Total	12 "

[12] International Encyclopedia of Surgery, VII, 528.

the age not being given in the remaining cases (7).

As to symptoms, physical signs and diagnosis, little need be said, as the tumor is always evident. Usually there is but slight pain and slight tenderness, but little inconvenience from pressure, and the presence of the tumor seems to be the main diagnostic sign. The size will vary from small tumors, such as were present in both of my cases, to the size of a fetal head, or to one weighing twelve pounds, as in a case reported by Dudon, or the very large tumor of Weinlechner, a composite sternal and mammary tumor, which extended from the middle line to the axilla, and from the clavicle to the border of the ribs.

The prognosis, for immediate recovery at least, is good. In Heyfelder's twenty-five cases, none of which was operated on for tumors, only two died. In Otis' fifty-one cases, eighteen died. In the nineteen cases here reported, in the first case the final result was not stated; of the remaining eighteen, four died, a mortality of 22.2 per cent. This is the more remarkable in consequence of the extent of some of the operations, such as those of Koenig, Küster, Mynter, etc.

The chest necessarily becomes narrowed when any large portion of the sternum is resected, as is stated by Bardenheuer and Koenig, but this seems to result in relatively slight inconvenience, either as to respiration or from the loss of support of the arm. In my first case, in which one-third of the left clavicle and practically all of the manubrium were resected, the use of the left arm is quite as good as that of the right.

Operative Technic. — The only treatment for the tumors under consideration is removal. If they are benign it is well, if one can do so, to keep the periosteum, but in the majority of cases, and certainly in all malignant cases, the periosteum should be removed with the bone. Bardenheuer advocates, in certain cases, osteoplastic resection of the bone, and states that he has waited as long as eight days before replacing the temporarily displaced bone. Of course, this procedure would only be applicable to those cases in which either a retro-sternal tumor was removed, or a temporary resection would

be resorted to in order to ligate the vessels.

The best incision, when it is practicable, consists in making a flap. Instead of this, however, the incision may be a T, an L or an 90° I incision, being necessarily varied according to the circumstances of each case. In a good many cases, as in both of my own, the skin and soft parts in front of the bone must be sacrificed, because they are involved in the disease. When it is possible, at the conclusion of the operation, it is best to close the opening, either by sliding the flaps or otherwise, but in many cases this will be impossible, and, as in my first case, the cavity must fill by granulation-tissue. In some cases, as in my first case, in order to get free access to the bones, it is better to remove entirely the soft parts, laying bare the bones before their resection. This facilitates their resection very greatly, by getting out of the way the mass of the tumor.

After the incision has been made, the next step is the removal of the inner end of one or of both clavicles. The amount of this bone to be removed will depend, of course, upon how much is involved in the disease. If the disease be sternal alone, usually the inner third of the clavicle only need be removed. The next step is the resection of the ribs and their cartilages as close to the sternum as the circumstances of the case will allow. This will be followed by the division of the intercostal muscles and other tissues, great care being taken not to open the pleura or the pericardium, or to wound the internal mammary artery. Roulliès has shown[13] that this artery runs at a distance from the edge of the sternum varying from five to sixteen millimeters; that its position is not alike on the two sides of the body in the same patient; and that the narrower the sternum the further away is the vessel. If wounded, it can be secured, as in my second case, with a ligature passed by a curved needle.

The sternum now being cut loose from the clavicle, and the cartilages of the ribs being divided, the sternum and the tumor are lifted by blunt hooks and separated from the retro-sternal tissues. This is best effected by blunt dissection, and in my first case I found that the finger was by far the best means by which this could be done. I was so fortunate as to be able to separate the manubrium from the tissues behind it, including the great vessels of the neck, without even seeing any of them except the left jugnlar vein in the neck. If adhesions exist between the pleura and the pericardium great care must be taken to separate them without opening either of these cavities, if possible. As pointed out, especially by Koenig and Küster, an assistant's finger should follow the fingers of the surgeon with a pledget of gauze, so as to be ready instantly to stop any opening in either of these membranes. In the case of typhoid osteomyelitis before referred to, I occluded the opening in the pleura by a pledget of iodoform-gauze, suturing the flap of skin over this and allowing it to remain *in situ* for three or four days.

In some instances instead of a resection of the bone in its entirety the maneuver adopted by Mynter is the best, namely, to trephine the sternum at a given point and then with the double rongeur forceps, gouge, chisel or bone-pliers to remove the diseased portion piecemeal. Sometimes the saw can be used to advantage. As pointed out, especially by Bardenheuer, in cases of retro-sternal abscess, simple trephining is of little value. Such an abscess is likely to be very extensive on account of its spreading in the loose tissues behind the sternum and it will need complete and thorough drainage. After trephining, therefore, a large portion of the bone should be removed by the rongeur, gouge or chisel. Indeed, Bardenheuer states that in four cases he removed all the manubrium and gladiolus, with the costal cartilages and the inner ends of both clavicles, and in each case obtained recovery.

Beside the dangers to the pleura, pericardium and the internal mammary arteries, the great vessels at the base of the neck and top of the chest are, of course, the principal and most threatening. That they can be avoided is shown by the fact that in only one case (VI in the table) was any one of them torn. In this case, the internal jugular being torn, Barden-

[13] Resection du Sternum Thèse de Paris, 1888.

heuer tied the right innominate, subclavian, external and internal jugular veins, and the patient recovered. In addition to this, the remains of the thymus gland, and, as a distant but possible danger, the phrenic nerves should be remembered.

If the soft parts in front of the sternum have been resected, thus leaving a large, gaping wound, it is impossible after a certain time to avoid more or less suppuration from later infection during the granulating process. In my first case this was a very serious danger and the pus threatened to make widespread havoc behind the gladiolus, and I feared at one time would enter the left pleural cavity. I adopted, therefore, Cathcart's method of drainage, which answered admirably. The cavity was kept absolutely free from the accumulation of any fluid and a light packing of iodoform-gauze absorbed what little was left.

RESECTION OF THE STERNUM FOR TUMORS.

No.	Reference.	Sex and Age.	Nature of Tumor	Parts Resected.	Complications.	Result.	Remarks.
1	Holden, British Med. Jl. 1878, II., 358.	F. 52	Sarcoma of gladiolus.	Imperfect removal of tumor only to posterior surface of the bone.			The more successful methods of modern surgery were hardly then in vogue.
2	Koenig, Centralb. f. Chir., 1882, No. 42.	F. 30	Osteoid chondroma of gladiolus.	Part of manubrium, the gladiolus and the ribs from 2d downwards.	Both pleuræ and pericardium opened. Both internal mammaries tied.	Recovery. Died 2 years later from recurrence in lungs.	Only slight respiratory trouble; great frequency of pulse.
3	Küster, Berlin. klin. Woch., 1882, 127.	M. 30	Gumma of gladiolus.	Right half gladiolus and 3d and 4th ribs.	Left pleura opened.	Recovery.	
4	Pfeiffer, Beitrag. z. Kennt. d. Sternal Tumoren, Halle, 1884.	M. 45	Sarcoma of gladiolus	Gladiolus and 2d, 3d and 4th ribs.	Right pleura opened and pericardium exposed.	Died on 6th day. Pericarditis, hemo-thorax and pleurisy. Fresh tubercles in lungs.	Other tumors found at autopsy in 4th rib, pubes, in aortic glands, liver and right kidney.
5	Bardenheuer, Deutsch. Med. Woch., 1885, XI, 688.	F. —	Fibroid of manubrium.	Manubrium, ⅔ of clavicle, 2d and 3d ribs.		Recovery.	Tumor extended to larynx, gladiolus and both clavicles.
6	"	M. —	Sarcoma of clavicle	Manubrium, ⅔ clavicle, 1st and 2d ribs.	Int. jugular torn; tied right innominate, subclavian, int. and ext. jugular veins.	"	
7	"	—		Manubrium.		"	No other details given.
8	"	—		"		Death.	"
9	"	—		"		"	"
10	"	F. —	Retrosternal fibroid.	Manubrium, part of gladiolus, 1st and 2d ribs, and inner end of clavicle.		Recovery.	
11	"	— —	"	"		"	
12	Jaenel, Resectio Sterni, Inaug. Dissert. Erlangen, 1887.	F. 12	Sarcoma of manubrium.	Manubrium, 1st and 2d ribs.	Retro-internal tissues involved, and cauterized with nitric acid and cautery.	"	No return after a year.
13	Dudon, Jl. de Méd. de Bordeaux, June 1, 1890.	F. 28	Enchondroma of gladiolus.	Manubrium, part of gladiolus and 1st and 2d ribs.	Internal mammary exposed but not injured; suppuration of wound.	"	Tumor first removed by operation 27 months before; three small nodules removed 8 months later from pectoral and sterno-cleido-mastoid; ascribed to injury from bringing elbows forcibly together behind her back.
14	Mazzoni in Dudon's paper).	M. 55	Myxo-sarcoma of gladiolus.	Gladiolus, 2d, 3d and 4th ribs.	None.	Death on 5th day from pneumonia.	

RESECTION OF THE STERNUM FOR TUMORS—CONTINUED.

No.	Reference.	Sex and Age.	Nature of Tumor.	Parts Resected.	Complications.	Result.	Remarks.
15	Graves, Med. News, March 4, 1893, 241.	F. 44	Sarcoma of gladiolus.	3 x 3½ in. gladiolus and 2d to 5th ribs.	"	Recovery.	Right breast removed for carcinoma 22 months before.
16	Doyen, Arch. Prov. de Chir. 1895, IV, 633.	M. 37	Sarcoma of manubrium.	Manubrium, parts both clavicle, and 1st rib.	"	"	Right and left brachiocephallicvein disclosed; lungs and heart seen, but neither pleura nor pericardium opened.
17	Mynter, Annals of Surgery, 1891, XIII, 96.	F. 20	Melano-sarcoma of gladiolus.	Gladiolus (6 sq. in.) from 3d nearly to 6th ribs, and 3d, 4th and 5th ribs	"	"	Weight between half and three quarters. Removed also glands from both axillæ and subclavian glands. Pericardium exposed; ascribed to injury from handle of broom. Dr. Mynter kindly writes me that patient died in Ireland about a year later, probably from recurrence.
18	Keen, Present paper.	F. 28	Sarcoma of manubrium and sterno-cleido-mastoid.	Manubrium, ⅓ clavicle, 1st rib and ⅓ sterno-cleido-mastoid.	Suppuration of wound; drainage by Cathcart's method.	"	No recurrence after 15 months.
19	"	F. 44	Carcinoma of manubrium and gladiolus.	Part of the manubrium and the gladiolus and 2d and 3d ribs.	Carcinoma of both breasts.	"	Left breast removed March 1, 1891; recurrent module in scar May 20, 1893. Right breast and parts of sternum March 22, 1894. Recurrence and death August, 1894.

A BRIEF OUTLINE OF THE THEORY OF THE MOVEMENT OF THE NEURON AS APPLIED TO NORMAL AND PATHOLOGIC MENTAL AND NERVOUS PROCESSES.*

F. X. DERCUM. M.D.,† PHILADELPHIA.

Subsequent to the reading of the interesting paper on The Neuron by Dr. A. O. J. Kelly,[2] a number of members of the Society requested me to give an explanation of the theory of the movement of the neuron as held by myself. As I have pointed out in a previous paper, the theory that the neuron is not an absolutely fixed morphologic integer has been advanced independently by several writers. When the thought first occurred to me that nerve-cells have the property of movement, I examined the literature and found that it had already been announced independently by three writers, one in Germany and two in France. The first to advance such a view was Rabl-Rückard, who in 1890 suggested that nerve-cells have ameboid movement. At the same time he pointed out the significance of this view in enabling us to explain the phenomena of hysteria. His ideas, however, attracted no attention, but in 1894 Lépine, in relating a case of hysteria of peculiar form, advanced practically the same theory. His idea was that the neurons were capable of movement to such an extent as to enable them to alter the degree of their relation to each other. Some six months afterward another French writer, Mathias Duval, advanced the same theory in a communication made to the Société de

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†Clinical Professor of Nervous Diseases in Jefferson Medical College; Neurologist to the Philadelphia Hospital.

[2] Transactions Philadelphia County Medical Society, 1896, p. 215.

Biologie. Lépine had been unaware of the view advanced by Rabl-Rückard, and Mathias Duval was equally ignorant of that advanced by Lépine. A week after Duval had announced his theory, Lépine before the same society repeated his former arguments in its support. I myself presented the theory of the movement of the neuron in a paper read before the College of Physicians of Philadelphia, in January, 1896; and in June of that year read an address on the same subject before the American Neurological Association. In the meantime, in the spring of 1896, the theory had been again advanced by two other French physicians, Azoulay and Pupin.

This theory has now begun to attract general attention and is gradually meeting with support. It has been opposed, however, by the distinguished Spanish histologist, Ramon y Cajal. I will not take time to consider at length the views of this investigator, as I have already done so in a previous paper. I will, however, pause sufficiently long to point out that his argument bears within itself its own refutation. He maintains that nerve-cells do not move, but on the other hand that the neuroglia-cells move. He points out the fact that the processes of the neuroglia-cells have numerous short aborescent and plumed collaterals, and he states that in these cells two different phases can be observed: first, a stage of contraction, that is a stage in which the cell-processes become shortened; and secondly, a stage in which the cell is relaxed, that is a stage in which the processes of the neuroglia-cells are elongated. He maintains that the processes of the neuroglia-cells represent an insulating and non-conducting material and that during the stage of relaxation these processes penetrate between the aborizations of the nerve-cells and their protoplasmic processes, and thus make difficult or impossible the passage of nerve-currents; on the other hand, in the stage of contraction the processes of the neuroglia-cells are retracted and they no longer separate the processes of the nerve-cells, and the latter are thus permitted to come into contact. Evidently Ramon y Cajal admits the very thing against which he contends, for if the nerve-cell processes are at one time not in contact and at another are in contact, they must certainly move, and the question before us is self-admitted. It matters not whether the processes of the nerve-cells move little or move much, but that they move at all is the question at issue, and this Ramony Cajal admits, though he makes the movement a purely passive one. It is certainly a minor point whether the movement of the processes of the nerve-cell is active or passive; although it is in the highest degree improbable, and is certainly not evident from the histologic facts at our disposal, that the neuroglia-corpuscles play the roll of an insulating material.

While the movements of nerve-cells have not been observed in vertebrate animals, such an observation has been made in an invertebrate form. A German investigator, Wiedersheim, in 1890 saw, in the living animal, leptodora hyalina, an entomostracon, the nerve-cells in the esophageal ganglion move. This ganglion may in a sense be regarded as the brain of the animal, inasmuch as it receives the fibers of the optic nerve, and Wiedersheim actually saw these cells move and change their shape, and this movement he describes as slow and flowing. (He presents a number of drawings of the esophageal ganglion made at different times, showing the various shapes assumed by the nerve-cells.) This observation evidently possesses a profound significance. It does not matter that it was made upon a form far removed from the vertebrates, for we should remember that it is just in the lower forms that general biologic truths have been demonstrated. I will not occupy time with a further consideration of the facts on which this theory rests, but will proceed at once to its application to normal and pathologic mental and nervous processes.

Before beginning a systematic consideration of the theory, it may be well to give as an illustration of its simplest expression the supposed behavior of the neurons in a case of transient hysterical paralysis. Hysterical paralysis, as we all know, may be so complete as to simulate very closely paralysis due to a gross lesion, and yet in the course of a few hours or perhaps in a few minutes such paralysis may absolutely

disappear. Modern students of hysteria are convinced that hysteria is a *bona fide* affection, with a syndrome that is as characteristic as that of any of the diseases with which we are acquainted. The idea of voluntary simulation has no hold on the minds of neurologists to-day. What is it that happens in the nervous system when a limb, say an arm, is suddenly paralyzed, remains paralyzed for a time and again suddenly recovers its function? Evidently some change has taken place in the nervous system. Let us see how the theory of the mobility of the neuron enables us to explain the phenomena.

The neurons of the motor area of the cortex, as you are aware, present not only protoplasmic extensions directed towards the surface of the cortex, the dendrites, but also a protoplasmic extension downward, which becomes a nerve-fiber, but which is, properly speaking, a process of the cell-body, no matter what its length may be. This process, which is now known as an axon, extends downward through the white matter of the brain, the internal capsule, the crus, the pons, the medulla and the cord and terminates in the last in a brush-like extremity, the end-tuft. By means of this end-tuft the cortical cell is brought into relation with the motor nerve-cells in the spinal cord. What the relation between this end-tuft and the nerve-cell in the anterior horn of the spinal cord may be is not known. It is probably one of contact or of close proximity. That an actual continuity of structure between the end-tuft and the spinal cell does not obtain is now absolutely known.

Now what happens in the case of hysteria in which the arm has been paralyzed? As the result, we will say, of an emotional or other psychic shock, or possibly of a physical shock, the neurons of the arm-center of the cortex retract their processes and in such a way that their end-tufts in the spinal cord no longer bear their normal relation to the spinal neurons. In other words, the connection between the cells is broken. We will suppose now, as many of us have seen, that as a result of suggestion, either with or without hypnotism, or spontaneously, the paralysis of the arm disappears. According to the view here advanced this disappearance is due to the extension or protraction of the processes previously retracted—that is, the end-tufts resume their normal relations with the spinal neurons and function is re-established. Certainly no other theory explains so readily the appearance and disappearance of hysterical paralysis or of hysterical anesthesia. In these conditions there is really a lesion, consisting of a break in the normal relations of the neurons, due to retraction of cell-processes.

As regards the movement of the cell-processes, it is highly probable that this property is not limited to the end-tufts of the axons, but that it is also shared by other processes of the nerve-cell, especially the collaterals, and perhaps even, to some extent, by the dendrites. A further possibility suggests itself, and that is, that the movement may be not simply one of retraction or protraction, but also lateral in direction.

Having acquired a clear conception of what is meant by the movement of nerve-cells, let us proceed to apply the theory in a systematic manner and let us see how readily it enables us to explain various normal and pathologic phenomena. Let us take, to begin with, the familiar instance of sleep. Sleep has been commonly attributed by physiologists to an anemia of the brain, notwithstanding the fact that true and undoubted anemia of the brain, such as follows great loss of blood, or accompanies marked general anemia is not attended with somnolence, but rather with insomnia. Let us see how the movements of the neurons will account for sleep. Evidently the neurons, when functionally active, must be in relation with one another. Their processes must be either in contact or nearly so. Evidently this condition is a prerequisite of consciousness. Now what happens when the nerve-cells are exhausted by fatigue, when their volume and their cell-contents have been diminished, as we have every reason to infer is the case, from the experiments of Hodge? Evidently their processes become retracted and they are no longer in relation with one another. The neuron isolated from the rest by retraction must be without function. General retraction of neurons must mean absolute loss of function, must mean unconsciousness, must mean sleep. In other

words, in sleep the neurons have their processes retracted; in consciousness their processes are extended.

See, also, how beautifully this theory enables us to explain pathologic unconsciousness, such, for instance, as attends cerebral concussion. A man, while conscious, receives a severe blow upon the head; the neurons suddenly retract their processes, and unconsciousness results. Certainly no other theory for the explanation of the unconsciousness of cerebral concussion is equally simple, or equally plausible. It is extremely probable also that other forms of unconsciousness are to be similarly explained; for instance, the unconsciousness of chloroform or ether anesthesia, or the sleep produced by drugs. In these conditions it would appear that the neurons, by virtue of the direct action of the substances introduced into the circulation, retract their processes, and, for the time being, sever their relations with one another.

Let us now turn our attention briefly to elementary normal psychic processes; let us take up, for instance, the physiology of perception. What are the changes that take place in the neurons when a thing is felt or seen? Let us take a simple illustration, such as I have used in a previous paper. Let us assume that a sequence of sound-vibrations impinging upon the peripheral auditory neurons—that is, the nerve-cells of the spiral ganglion of the cochlea—produces in these neurons a change that affects the relations which their neuraxons—that is, their centripetal processes—bear to the nerve-cells of the auditory nuclei of the medulla, and secondarily to the neurons in the auditory area of the cortex. It is probable that the effect produced upon the latter is such as to cause them to retract, extend or otherwise move their processes, and thus bring about a change in the relations which the various neurons of the auditory area of the cortex bear to one another. It is evident, further, that the same sequence of sound-vibrations must always produce the same changes in the cortical neurons. In other words, given sounds are represented by certain combinations of the neurons with one another, and these combinations persist only so long as the vibrations impinge upon the auditory apparatus. An act of perception, therefore, consists of changes in the relations of the cortical neurons with one another; these changes corresponding to, and depending upon, certain physical impacts upon the sensory organs. As a corollary, the combinations among the neurons so formed bear definite and fixed relations to the external world.

Now what is the physiology of a conception? Evidently it consists in the reforming among the neurons of an old combination—that is, a combination the same as, or similar to, what was originally produced by a physical impression upon the organs of sense, but which is now produced by some other agency. Thus, a given note produces a certain combination among the neurons in the auditory area, and the forming of this combination is an essential part of the act of perception. To my mind, the act of conception consists in the formation among the auditory neurons of the same combination, without the actual impinging of the sound-vibrations upon the ear. The explanation of the reproduction of old combinations in the cortex, without external sensory stimuli, I will, for a moment, defer, and pass to the consideration of memory.

Various theories have been advanced to explain the phenomena of memory, but I will not take time to consider them, simply showing how readily the theory of the mobility of the neuron explains this remarkable property of mind. Let us recur for a moment to the illustration just used. We will say that a sequence of sound-vibrations has impinged upon the peripheral auditory neurons, and, in turn, has caused the neurons of the auditory cortex to move their processes. Now, other things equal, the degree of the excitation depends upon the intensity of the physical impact upon the auditory apparatus. Evidently the number of auditory neurons aroused into action must vary greatly, and it is probable that the movement does not cease in the auditory area of the cortex, but is diffused among neighboring areas, and even among those which are relatively distant. Now, we will suppose that a sequence of sound-vibrations has caused the auditory neurons to assume

new relations with one another. These new relations will depend largely upon the fact whether or not a similar sequence of impressions has passed through those neurons before. If so, the old combinations will be re-formed and, as a corollary, there follows the recognition by the *ego* of the sounds as something heard before. Here we have an elementary illustration of the act of memory. According to this view, memory does not depend upon fixed cerebral structure, but upon the combinations of the neurons formed from time to time being the same as, or similar to, those that have been formed before. Let me illustrate a little further: the excitation that has been produced in the auditory area of the cortex gradually diffuses in various directions—that is, there passes from the auditory center of the cortex, through the general cortex of the brain, a series of combinations among the neurons along the oldest and best traveled lines. At first a given sequence of musical sounds suggests merely a familiar air, but, a moment later, when the movement has diffused as far as the visual areas of the cortex, old combinations are re-formed, which now give rise to visual memories, and, instead of merely the memory of a familiar air, we have in addition a visual memory of an instrument, or a person with whom the air is associated, or, perhaps, of an operatic performance. I might enlarge upon this theory of memory, but time will hardly permit. Let us bear clearly in mind, however, that memory is not due to any constant condition of structure, but merely to the forming anew of old combinations among the neurons.

Other psychic phenomena also find a ready explanation on the theory here advanced. We can readily understand, for instance, how sequence of thought is explained by the movements of the neurons. If the neurons are constantly changing, if from the hour of awakening they are constantly responding to stimuli from without by changes in their relation to one another, it follows that the sequence of thought itself depends upon the sequence of these changes. Herein lies, also, the explanation of the continuity of thought. The direction of thought, and the association of ideas, must depend largely upon the frequency, and the consequent readiness with which special combinations among the neurons have been and are formed. Another idea also suggested in this connection is that not all of the neurons are active at the same time, but that the number varies greatly. However, I shall not pause to further consider this aspect of the subject.

I shall now call your attention briefly to the application of this theory to various pathologic conditions. Let us take up some of the simplest phenomena observed in insanity. What is an hallucination? An hallucination I would define as the spontaneous formation of an old combination amongst the neurons representing a former perception or conception, as the result of pathologic conditions, and not in response to normal stimuli either from without, such as physical impacts upon the sensory organs, or in response to normal stimuli from within, such as preceding and connected trains of thought, or other normal psychic processes. The combination representing an hallucination reacts in such a manner upon the general neurons of the cortex as to give rise to the belief in the reality of the sound, vision or other special sense manifestations.

What is an illusion? An illusion is such a faulty combination of the neurons among each other as to lead to an imperfect recognition by the *ego* of the object perceived. Take, for instance, a case in which a cord or rope is mistaken for a snake. Here we have physical impacts normally received by the sensory apparatus, but, owing to a diseased condition of the neurons, these impacts lead to incomplete and erroneous combinations. We have already learned from the investigations of Berkeley, Andriezen and others that the neurons, as a result of the action of various toxins, such, for instance, as alcohol, may become diseased, and especially their processes. There would, therefore, seem to be every justification for regarding illusions as dependent upon faulty combinations among the neurons.

What is the pathology of a delusion? Here again it is probable that the explanation is to be sought in disease of the structure of the neuron, and especially of its

processes. It is characteristic of a delusion that the patient is incapable of accepting evidence in relation to his false belief, even when that evidence is properly presented. It would seem that in the case of a delusion it is impossible for the neurons to form such combinations with each other as will bring the patient into proper relations with the outer world. A simple illustration will make my meaning clear. The man who believes, for instance, that he has no mouth, in spite of the most direct physical evidence to the contrary, presents an instance in which a lesion has taken place among the neurons which renders them incapable of forming normal combinations in response to physical impacts upon the sensory organs. Again, it may be that a correct combination representing a perception or a conception is formed, but in such case the neurons of adjoining areas are defective, in that they cannot bring this combination into normal relation with the general neurons of the cortex.

How can we explain such a symptom as delirium, or the mental condition seen in confusional insanity? Evidently, owing to disease of the neurons, the disease being transient and due to the presence of toxic products in the case of delirium, or being possibly structural in the case of confusional insanity, the neurons act irregularly and wildly, making constantly the most erroneous combinations with one another. Fully formed and partially or erroneously formed combinations rapidly succeed one another; probably also without relation to previously established lines of diffusion. It is easy also to explain the expansive mental state of mania and the depressive state of melancholia by merely supposing in mania that as a result of pathologic causes, generally toxic disturbances of nutrition, the neurons are acting with excessive rapidity and that a greater number of them are active then under normal conditions; and in melancholia that the movements are restricted and slower, and that a smaller number of neurons are active.

I had intended also to show the application of this theory to such pathologic conditions of the nervous system as are seen in hysteria and hypnotism. I have already instanced its application to one phase of hysteria, namely, hysterical paralysis. Let it suffice to say that all of the symptoms presented by hysteria, even the convulsions, can be explained by it. I will not, however, more than allude to this portion of the subject. To hypnotism, however, I will devote a few words, inasmuch as the theory of the mobility of the neuron is the only one that affords a rational explanation of this phenomenon. Let us recall to our minds for a moment the condition of the neurons during sleep: their processes are retracted. Hypnotism is partial sleep—that is, a state in which only a portion of the neurons have their processes retracted. Let me illustrate my meaning a little more in detail. Let us take a case in which hypnosis is induced by the ordinary method of staring fixedly at an object and in which at the same time the suggestion of sleep is made verbally by the operator. Now, by reason of the effort of the attention, expended through both the visual and auditory channels, the neurons of the corresponding regions in the cortex are thrown into certain relations with one another, relations that correspond first to the action upon the ocular apparatus, and, secondly, to the words of the operator received through the auditory channels. Very soon, by reason of the visual fatigue and under the auditory suggestion of sleep, the neurons of the visual area retract their processes and the partial sleep of hypnosis begins. Gradually the sleep grows deeper—that is, by reason of the same influence, the other neurons of the cortex gradually retract their processes, with the single exception of those by means of which the verbal suggestion of sleep has been received, namely, the auditory channels. In other words, the consciousness of the individual has been restricted to the narrow field of auditory perceptions. While in this condition, somnambulism is readily induced. In response to words from the experimenter certain movements are induced among the neurons in the auditory cortex, and these movements, being communicated gradually to the neurons of other areas of the cortex, for instance the motor area, may lead the individual to perform certain automatic acts or manifest signs of cerebral activity referable to other portions of the cortex.

I might still further elaborate this most

interesting subject, but I must content myself by merely indicating the method by means of which hypnotism is to be explained. To my mind the theory here advanced is the only one that satisfies the facts.

I have endeavored to present in this paper my own views as to the application of the theory of the movement of the neuron and in as condensed a manner as possible. Any one of the special applications I have indicated could be enormously expanded. My desire, however, was to present this evening an outline merely of the subject, and I think that all will agree with me that the theory of the movement of the neuron is not only plausible, but captivating in the extreme, as it makes clear and comprehensible much that otherwise cannot be understood at all.

TUBERCULOUS PLEURISY.*

DR. CHARLES CARY,† Buffalo, N. Y.

The case which I present to you this morning will appear, in general aspect, to be very complicated, but, in reality, it is quite simple. It is a perfect typical and classic case, such as you will not uncommonly see, but about which, if you are not thoroughly grounded in the analysis of the symptoms, you will be apt to be misled.

History:—J. M., twenty years of age, native of Italy, occupation not known, single. Diagnosis at the time of his admission, pleurisy with effusion, family history negative, has been in America for two years, previous to that time was healthy. Illness began three months ago, when he noticed a soreness on the left side, aggravated by taking a long breath. Physical diagnosis from Hospital record: Dullness at base of the left lung, both anteriorly and posteriorly. Pectoriloquy. On auscultation, absence of breathing sound over lower part of chest anteriorly and posteriorly, as high as the angle of the scapula. June 9, aspirated 500 C. C. of brownish albuminous fluid from the chest; June 10, two thousand C. C.; June 15, twenty-five hundred C. C.; June 16, upon auscultation of the cardiac region a pericardial friction sound was heard. June 29, aspirated fifteen hundred C. C. of slightly bloody fluid from the pleura. A pericardial friction sound may be heard in the precordia; also pleuritic rubbing along the anterior and posterior part of the chest. Inspection of the right side anteriorly shows more movement of the chest. Pleuritic friction sounds more marked in the right than in the left infraclavicular region; most marked in the axillary and mammary regions of the left side.

The temperature does not range high—in the neighborhood of 100° F. The highest temperature during his stay in the hospital has been 101°; pulse 80 for five continuous days. The respiratory line runs in the twenties. Pulse, temperature and respiratory lines show there is no grave febrile condition. Vocal fremitus is more marked on the right side than on the left, in the lateral line. Breathing uncommonly slow in the upper part of the left chest and of broncho-vesicular character below, the bronchial element obscures the friction sound. There is pleuritic sound of the same character on the right side; respiration less pronounced on this side; pleuritic frictions below. Laterally and posteriorly there is a limited area of flatness; worse on the right side than on the left.

There is one point which is of great significance in this case. At the time of his admission there was an induration and feeling of resistance, apparently located in the abdominal wall, or immediately be-

* Medical Clinic, Buffalo General Hospital.
† Prof of Materia Medica and Therapeutics, and of Clinical Medicine, Medical Department, University of Buffalo.

neath it. After the pleurisy, the abdomen began to be the principal seat of pain, and on account of this mass a laparotomy was performed, and on exposing the peritoneal surface it was found that the omentum and the exposed peritoneal surface were in an active state of infiltration and inflammation, and we recognized the gross appearance of tuberculous peritonitis. Obstinate constipation, which is undoubtedly due to pressure and adhesions of the peritoneal surface, has resulted.

This is a case of serious tuberculosis.

I wish to impress a point that is not absolutely true, but is true in a general way, namely, that serous membranes do not become inflamed primarily. Inflammation of the meninges, pericardium, peritoneum and pleura are all secondary—(and often tubercular) with some occasional primary cases.

I believe what transpired here was simply a direct diffusion of the tuberculous process from lung to pleura. There was trouble in the base of one or both lungs and, as the result of this, the pleura became attached, and thus the natural processes of repair commonly successful in such cases were prevented. You will see this time and time again. You will draw the fluid, inflammation will subside, and the pleura will recover, but you need not necessarily have had a case of primary pleurisy. All cases of tuberculosis do not necessarily lead to phthisis. There is a saying which may not be altogether true, but which, I think, you may well remember: Everybody is more or less tuberculous at some period of his life, therefore the degree of resistance present to tuberculosis is very great. We know this from seeing cases here; they keep coming back instead of getting thoroughly well. The tuberculous process in this case passed from the pleura to the peritoneum, or may have come from the peritoneum to the pleura; it can go either way. How? Though a direct chain of lymphatics, which exists in the diaphragm?

There is a direct channel of communication—so to speak—between the peritoneum and the pleura through the diaphragm, and we may find pus in the chest due to abdominal disease, commonly intestinal suppuration. Ordinary intestinal bacteria, but more particularly pathogenic forms, may be found in the chest, coming from intestinal disease. I had two cases here in the winter season of abscess of the liver, in which the hepatic condition gave rise to purulent pleurisy. Tubercular disease, such as is seen in this case, is a slow process, and sometimes we find enormous masses of this tuberculous material presenting no subjective symptoms at all. I remember a case of peritoneal tuberculosis which had come to an enormous development before any manifestation directed attention to that region. I have known in this institution, under the advice of competent men, a case operated upon for abdominal tumor, and after operating the tumor proved to be tuberculous peritonitis, particularly of the omentum.

Laparotomies are often performed with the full knowledge that the case is tuberculous peritonitis. This often does more good than harm, for tuberculous peritonitis is often curable. Tuberculous peritonitis has been exposed by laparotomies undertaken under a false diagnosis, and upon observation the abdomen has been closed up and a recovery has resulted. Mistakes of this sort have taught us that cases of this disease do recover. This man has undoubtedly developed tuberculous meningitis. He howls, keeping every one awake in the ward; has pain in the head, extending to the back of the head and neck, and which becomes intense when he is put in a sitting position. This excruciating pain is typical of meningitis. He has no ptosis or strabismus.

Treatment:—I think it will be unsafe to make a prognosis so far as duration is concerned. Though I have rarely witnessed the recovery of such cases, I never despair of them. The laparotomy which has been performed is very good treatment, to be recommended even after positive diagnosis has been made, not with a view to cutting out the tuberculous material, but to open up and excite the inflammatory process, which is a process of destruction. This man has not enough fluid to justify tapping. What shall we do with the patient? Treat him along the line of manifested symptoms. Keep him quiet, not with morphine, or with any

drugs that interfere with the nutrition, but by mild esoterics, such as bromids. We must maintain the general tone. The bowels should occupy our attention. They have not moved since he has been on the medical side of the house. In these cases there is apt to be absolute occlusion of the intestines. On the other hand, irritation of the peritoneum is often sufficient to produce diarrhea, which, in turn, must be corrected. The agents which seem to answer the best purpose are the preparations of iodin, as iodid of iron, and arsenic, particularly in conjunction with iron. I should be inclined to put this man first upon arsenous acid, one to two miiligrams, with ten centigrams of iron by hydrogen. If the amount of fluid increases in the abdomen, and it becomes necessary to draw it, aspirate.

CURRENT LITERATURE CONDENSED.

Is Gynecology Destined to become an Obsolete Specialty?[1]

The phenomenal interest in gynecology manifested by the profession during the past few years has been shown not only by the flood of special literature annually poured out and by the number of societies devoted to this branch of surgery, but by the fact that young men are crowding into this specialty to an extent which warrants the inference that the supply already exceeds the demand. Moreover, the prominence which has been given to gynecology in all our post-graduate schools, where it has always been the popular subject, has tended not only to increase the special knowledge of the general practitioner, but to lead him to believe that any one can be a gynecologist. We have frequently in these pages deplored the ultra-surgical trend of this specialty, and have predicted that a reaction would come. Such has been the history of every American fad which has been pushed to its extreme limits, whether in medicine or in fashion. This reaction has already set in, as shown by the conservative practice and teachings of men who were formerly most radical in their methods.

But, unfortunately, the attempt unduly to exalt gynecologic surgery at the expense of non-surgical treatment has reacted somewhat disastrously upon gynecologists themselves. Not content with confining themselves to their proper region, they have reasoned that their familiarity with abdominal surgery should render them the equals, if not the superiors, of general surgeons in the handling of cases which bear no relation to diseases of the pelvic organs.

We shall not discuss the propriety of this tendency to broaden the sphere of gynecologic surgery, or seek to deny that special operators have been remarkably successful in general surgery, but would merely call attention to the fact that gynecologists have only themselves to blame if general surgeons have followed their example and now perform all the operations which they formerly left to their confrères. The natural process of reasoning has been: If gynecology has become purely surgical, why should it be confined to a special class of operators, who themselves no longer devote their attention exclusively to pelvic diseases?

But this is not all. We observe with regret that a decided antagonism has developed between the gynecologist and the general surgeon, as shown by frequent unfriendly comments in published addresses, society discussions, and even after-dinner speeches, each accusing the other of invading his territory and performing special operations with which he is unfamiliar. Now, as the surgeon is decidedly in the majority and is closely in touch with the general profession, the specialist is manifestly at a disadvantage, and must look to himself or he will "lose his grip." It will be his own fault if the noble branch of surgery, which has been enriched by the labors of so many master minds, ceases

[1] Editorial in the *Medical Record.*

to occupy the commanding place which it has held so long.

How is it that this change has come about in America, when abroad the distinction between gynecologist and general surgeon is just as sharp as ever? It appears to be due to some extent to the fact that the commercial factor has become prominent, to the exclusion of the scientific. The brilliant spectacle of the operating-theatre has been regarded as more attractive than the solid results of the laboratory. Pathology has given place to improvements in operative technique. In short, gynecologists have been so anxious to devise new surgical methods of treating every pelvic trouble, that the fact has been largely lost sight of that important pathologic questions still remain as far from solution as they were ten years ago. If gynecology is to remain a specialty it must be because its followers continue to demonstrate the fact that they can do their own work better than general surgeons, and, moreover, that in many cases in which the latter overlook the more occult conditions, they can, by their greater knowledge and skill, preserve organs which the surgeon would sacrifice. It is along the line of conservatism that the battle will be fought, not of radicalism. It would be well for the coming gynecologist to bear this in mind, as well as the little-heeded advice not to launch out as a specialist without a thorough general training. Gynecology is a natural outgrowth of general surgery, but the contrary is far from being true, and any attempt to reverse this condition must end in ultimate failure.

Let gynecologists prove that their specialty is capable of development along other lines beside those of radical surgery, and there is no danger that it will ever come to be regarded as unnecessary.

The Welfare of the Worker.[1]

Baron Liebig once remarked that the best measure of the civilization of a people was to be found in their consumption of soap. We will not discuss the application of this standard to the upper classes in this and other countries, but will confine our observations to its bearing on the hygiene of the industrial section of the community. The manufacture of white lead, for instance, is above all others that in which the maintenance of the most perfect cleanliness of the person, attainable only by frequent ablutions of the entire surface of the body, is absolutely necessary to the preservation of health, if not of life itself; yet how or where can those engaged in the deadly work obtain the requisite facilities? When several years ago we were commissioned to report on some lead works we found that the employers considered that they had done their duty in providing in an open shed a number of sinks with cold water all the year round, barrels of soft soap, nail brushes, and roller towels, which the workmen and women were expected to use during the hours allowed for the meals.

Contrast with these primitive and meagre arrangements those at the works of W. Leyendecker & Co., at Kölu, where, attached to each workshop, is a series of lavatories, each man having a separate apartment for his sole use, warmed in winter, with tip-up basin, hot and cold water, soap, nail and hair brush, towel and glass tumbler, as well as a wardrobe in which, before going to work, he deposits his ordinary clothes, putting on a factory dress which is served out clean every Monday morning. Four times a day, before breakfast, dinner, tea, and previous to leaving work, he goes through a methodical ablution of hands, arms, chest, face, and with successive changes of water, and rinses his mouth and nasal passages, resuming his ordinary attire before going to his home. In a separate building are twelve copper tin-lined baths, where every workman may enjoy a warm bath during working hours at least once a week, and for those employed in emptying the oxidizing chamber, or "stacks," the most dangerous work by far, are several warm spray baths where they may wash from head to foot as often as they like to avail themselves of it. The whole of the lavatory and laundry arrangements are committed to a separate staff of superintendents and attendants.

This is no exceptional case, save as regards the specially dangerous nature of the work; it is nothing unusual to find in

[1] From *The British Medical Journal.*

connection with cotton or woollen mills, breweries, and other industries of an equally neutral character, bathing establishments rivalling if not excelling in the completeness and even luxuriousness of their arrangements those opened of late years in this country by the municipal authorities, or as commercial speculations. For the perfection of their arrangements the Augsburg worsted mills deserve special notice. Here, as wherever men and women are employed, the baths for the two sexes are entirely separate and under the supervision of a master and matron respectively, while complete privacy is secured to each bather. A roster or time-table is posted in the waiting-room and in each workshop, the overseer of which tells off the persons under his charge in accordance therewith every hour, regard being had against interruption of the work; for example, of two men minding a mule, only one may leave at a time. They give their tickets to an attendant, receiving in exchange a clean towel, comb, and piece of soap, and are conducted to the baths indicated by the number of the ticket, where they are allowed to remain half an hour, the rest of the hour being devoted to the cleaning up of the bath-room by attendants. On leaving they give up the towel and comb, which are sent to the laundry, and the soap, which is then used for washing the wool. The laundry is provided with a rotary washing-machine and centrifugal washer for the combs, and a hot-air drying-room. From 6 to 8 A.M. and 1 to 3 P.M. are devoted to the thorough cleaning of the baths, corridors, etc., but every worker has one bath weekly, the engine men and stokers having two. There are also hot air and vapor baths, to be used on the order and under the instructions of the medical officer to the works. In all these factories the baths are used during the hours of work, the operatives being paid for the time so employed, thus losing no part of their leisure or of their wages.

In the grimier employments of miners, and men engaged in foundries and smelting works, a daily bath is almost a necessity; and in some of our colliery villages the spectacle of wives washing down their husbands like so many horses in back yards or in more public places is by no means unusual; but in Germany provision is frequently made by the employers, though of a rougher description than those we have described, the baths being made to accommodate a dozen or twenty men at one time. At the Gneisenau colliery, near Dortmund, for example, the men on arriving at the pits change their clothes, which by way of precaution against theft are run up by pulleys to a loft in charge of an attendant. In coming from the pit they return their safety lamps, which they had received locked from the lampkeeper, and proceed to the bathrooms, where they are supplied with soap, washing flannels, and towels, and after taking a spray bath as a preliminary operation enter the tanks. In each room there are twenty separate stalls for the spray and four tanks to accommodate five men at a time. The water, which is in winter warmed by steam pipes, flows through these tanks in a constant stream, while once a day they are run dry for cleaning. The men then resume their ordinary dress, leaving their pit clothes with the attendant till their next shift in the pit, each man having his own hook distinguished by his number.

Fas est ab hoste doceri, and we have much to learn from our Teutonic rivals; but there are, we fear, many employers who would not be prepared to spend so much on undertakings which would not yield any immediate or palpable profit, while it is by no means certain that the trade unions would not resent compulsory ablutions as an interference with the liberty of the individual.

STICK to your legitimate business. Do not go into outside operations. Few men have brains enough for more than one business. To dabble in stocks, to put a few thousand dollars into a mine, and a few more into an invention, is enough to ruin any man. Be content with fair returns. Do not become greedy. Do not think that men are happy in proportion as they are rich, and therefore do not aim too high. Be content with moderate wealth. Make friends. A time will come when all the money in the world will not be worth so much as one good stanch friend.—*Beecher.*

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Editorial and Publication Offices, 1026 Arch Street, Philadelphia, Pa.

EDITOR
HAROLD HAVELOCK KYNETT, A.M., M.D.

ASSISTANT EDITOR
G. C. CLIFTON HOWARD.

STAFF EDITORS

A. L. BENEDICT, A.M., M.D.
BUFFALO, N. Y.

A. A. ESHNER, M.D.
Ex-officio Phila. Co. Med. Soc.

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H. H. KYNETT, M.D., MANAGER

WILLIAM H. BURR, M.D., ASSOCIATE MANAGER

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PHILADELPHIA, SATURDAY, MARCH 27, 1897.

EDITORIAL.

THE MEDICAL HUSTLER.

It is a serious question whether the development of modern business methods within professional life, however desirable from one standpoint, has not been accompanied by a tendency essentially degrading and liable to substitute for the extrinsic attractions of the older generations of physicians methods quite as far removed from genuine medical capability, though presenting the specious appearance of brightness and intellectual acumen. It is just as much an affectation for the old man to dye his hair and shave his gray beard, as for the young man to cultivate his whiskers and brush his scalp into a premature baldness; just as much a professional mannerism to push oneself into prominence socially, as to maintain a too dignified reserve when the object of each mode is to secure patients. Dignity may be the wisdom of a fool, but officiousness and constant seeking for notoriety is the scintillation of an intellect of low magnitude. More genuineness of purpose, more true dignity, which is unconscious of itself, more engrossment of attention on subjects directly connected with medical art and science, and less energy in proclaiming the professional wants and resources of the physician, are the needs of the present.

It is not simply an individual hardship, but a general economic mistake, that the livelihood of a man should depend on exertions beyond the field of his direct usefulness to society. We cannot expect to attain such a Utopian equalization of trade that advertising will become unnecessary, but, at least, the professions which are not composed of producers, and which are needed and justified only for certain special services to society, should be free from the element of competition, except as

it consists in the practical demonstration of ability to perform one's chosen function. The very existence of the medical hustler indicates that the balance between production and consumption of medical services has been disturbed, and the welfare, not only of the direct sufferers from this disturbance, but of society at large, demands that the equation should be restored as soon as possible, obviously not by fostering disease, but by diminishing the number of those whose existence depends on sickness and suffering.

One of the main outlets of the superfluous energies of the hustler is in so-called charity practice. Men who, a few years ago, scorned the idea of dispensary service, and took time to consider even a hospital appointment, now seem to have been converted to the idea that such connection is necessary to professional success, although the overgrowth of such practice, and the consequent diminution of paid services, has been repeatedly the subject of editorial warnings from all sides. If our profession is reduced to the low level which pessimists prophecy, and has become a mob of students, supported by whatever external means each may possess or obtain, subservient to lay boards of managers, and pushing and struggling for the privilege of rendering gratuitous services, for which the patient is not even grateful, there will be not a few to say that it will serve us right for the hypocrisy which we, as a profession, have practiced, or at least connived at.

We have posed as philanthropists when our "charity" work involved a *quid pro quo*; we have taught persons originally willing and still able to pay moderate fees, to seek gratuitous service, so that we might have greater glory, if less cash; we have begged lay assistance in putting charity practice on the highest professional basis, have represented our motives as lofty, and then have betrayed our lack of candor by scrambling after the chance of acting as the medical tools of lay generosity. Not as individuals, perhaps, but as a profession, we have done this wrong to ourselves, and we are just beginning to feel the logical consequences. The better the hospital or dispensary, the more students does the college want, the more students it gets, the more eager is it for clinical material, and the more lax does its insistence on genuine need of charity become. The more students, the more doctors; the more doctors, the less employment of each; the fewer patients, the more does the physician importune for dispensary service to occupy his time; the greater the crowding after positions at established dispensaries, the greater the tendency toward the endowment of new ones. Thus, these various factors act and react on one another in the most complicated manner, and the physician who has ambitions toward either financial or professional success, is more and more impelled toward that kind of sneak advertising which we call hustling, and which sometimes makes us blush when we compare it with the frank contempt which the quack has for ethics.

It is said that there is always room at the top. This modern tendency of medicine leaves room at the bottom also. There is a chance for the man who will be satisfied with a small income simply because he is incapacitated for earning more in any other employment, to support himself on emergency calls and the work which will naturally come to him after dispensary hours, or because of convenience or a persistence of the old independent feeling on the part of the laity. On the other hand, there is a field for a limited amount of practice at high rates, by men who can be supported for half a lifetime by extra-professional means, and who can command a sufficient influence to secure the requisite

experience and prestige in hospital and dispensary practice. But between these two breeds of hustlers, the average, wage-earning, ambitious physician, who is neither able to regard his calling as an occupation of leisure time, nor willing to accept the alternative of the other extreme, is being forced to the realization that medicine is not a satisfactory profession, however much he may love its practice. To the practitioner in a small village, it will doubtless seem that our apprehensions are groundless. To the man trying to establish a practice in New York, Boston, Philadelphia, Baltimore, or other medical centres, what we have said will appeal as a prophecy for the near future. If we have slightly exaggerated present conditions, it is only to call attention to the inevitable result of present indifference, and to rally the profession to take a firm stand against the growing evils of medical "charity" before such an endeavor is too late.

CORRESPONDENCE.

TREATMENT OF CROUP.

EDITOR REPORTER:—At this season of the year, when diseases of the larynx and bronchial tubes are apt to prevail both in the city and in the country, we are often puzzled what to do or devise for immediate relief. Where symptoms are urgent the parents of the sick child are often driven almost to desperation on witnessing its futile efforts to overcome the spasm of threatened suffocation.

I have been called at night to the bedside of a sick child, when it seemed to me that every attempted act of inspiration would be the last, in spite of our most active measures for its relief. Experience, however, has taught me to maintain a cool and collected demeanor, and not betray any anxiety as to the ultimate beneficial results of my treatment. Heretofore I have mainly relied upon the quick emetic properties of tartar emetic, zinc sulphate, or copper sulphate, given in solution with warm water, in teaspoonful doses. I do most heartily deprecate plunging the struggling child into a cold water bath, or even a hot water one, as I consider that the fright caused by the forcible immersion, contributes more towards aggravating the spasm than it does in affording relief.

Wrapping the throat and larynx in flannel cloths saturated with hot mustard water is a very good adjuvant to other treatment, but do please omit the hot or cold bath. A tablespoonful of ground mustard, to be stirred up with a quart of hot water, is about the proper strength of mustard water. This part of the treatment can be attended to by the nurse after the physician's instructions. The physician's particular duty is to use the most rapid measures known, for the relief of the muscular spasm.

This can be accomplished very effectually by spraying the mucous membrane of the throat (inside) by means of an atomizer charged with a two per cent. solution of cocain. An atomizer I generally carry with me, always during the winter and spring season. As a succedaneum to this treatment, after the relief of the spasm, I prescribe the following mixture, to be continued so long as moist, sonorous mucous râles are heard along the bronchial track during respiration:

℞

Sol. Tinct. Tolu, . .	℥jss.	ʒl ½
Syrup Squills, . . .	℥ij.	ʒ2
Tinct. Opii Camph., .	℥iij.	ʒ3
Glycerini, ...	℥js.	ʒl ½
Aquæ, ad., ...	℥vj	℥vi.
		Misce.

Sig.: A half teaspoonful to be given every three hours through the day, and every four hours through the night.

A. O. STIMPSON, M. D.

THOMPSON, PA., *January 29, 1897.*

ABSTRACTS.

PRESIDENT CLEVELAND'S ADDRESS TO THE DOCTORS.*

If, in passing through that period in boyhood when the desirable choice of future activity seemed to rest between running away from home to be a sailor and staying at home to be a doctor, I inclined toward the more quiet and orderly of these pursuits, this surely furnishes no basis at this late day for a claim of relationship to the medical fraternity. Nor do I forget that, less than seven years ago, I was accorded the pleasure of participating in the exercises when the corner-stone was laid of the building which is now the home of the organization which tonight celebrates its half century of useful and honorable existence. But this incident, which aroused an interest still undiminished in the welfare of the Academy of Medicine, hardly entitles me to a share in the felicitations of those who have since born the heat and burden of its work, while I have enjoyed the ease and happy surroundings of public station.

Confessing, therefore, that I have no right to even standing room within the inner circle of the profession, I have, boldly and without the least authority, determined to speak to you as a representative of the vast army of patients and laymen.

At the outset I desire to remind you that you owe us much. Though largely in the majority and with plenty of members to spare, those who are well conducted among us do not vex you with hurtful competition. Instead of making life hard for you by an observance of the laws of health, we assist you by indulging in all sorts of irregularities. We are obedient and submissive to your commands—that is, when we are sick—and we sometimes pay your bills, even after a recovery to health which we are always certain would have resulted without your interference.

In these circumstances, if when in perfect health we venture to assert ourselves and tell you what is in our minds, it is not fair to liken us to a certain personage who when sick a saint would be, though very differently inclined when well.

We begin by conceding most heartily, and without the least reservation, the learning and skill of those now constituting the medical profession, and the wonderful advance that has been made through their untiring labors and investigations in the alleviation of human suffering and the saving of human life.

It may be that this seems to you an acknowledgment so much your due as to be hardly worth making. You should, however, value it because it is sincerely made by those who were not born yesterday, but who hold in lasting and tender memory the ministrations of the village doctor of fifty years ago, and are now the living monuments of his faithful care. He, too, alleviated suffering and saved human life. We know that it was not given to him to see the bright lights that now mark the path of medicine and surgery, but you cannot convince us that he groped entirely in the dark. We remember without abhorrence his ever-ready lancet and the scars of his blood-letting found in every household. We endure with complacency the recollection of his awful medicine case, containing bottles, powders, and pills which, whatever might be thought of them now, seemed then to be sufficient for all emergencies, to say nothing of the tooth-pulling tools and other shiver-breeding instruments sometimes exposed to view. If he was ignorant of many of the remedies and appliances now in use, he in a large measure supplied the deficiency by hard-headed judgment, well-observed experience, and careful nursing. Besides, it was in his favor that he did not have to bother his head with many of the newly-invented and refined diseases that afflict

* At the semi-centennial celebration of the New York Academy of Medicine, in Carnegie Hall, New York, Jan. 29.—*The Christian Advocate.*

mankind to-day. He had no allotted hours for his patients, but was always on duty, and we knew the sound of his gig as it rattled past in the night.

Your ways are better than his; but we desire you to regard this admission as all the more valuable because it is carved out of our loyalty to our old village doctor, who brought us through the diseases of childhood without relapse, who saved from death our parents and our brothers and our sisters in many a hard combat with illness, and who, when vanquished and forced to surrender, was present in the last scene to close the eyes of his dying patient and sympathize with those who wept.

I hasten to say that we do not for a moment suppose that advancement in the science of medicine and surgery has smothered the faithfulness and tender consideration which characterized the practitioner of former days. If we seek charitable service to the sick and suffering, a noble appreciation of obligation to humanity, and self-abnegation in the discharge of professional duty, we must look for them among our physicians and surgeons of to-day.

If we have now arrived at an understanding, you are, I hope, prepared for a suggestion quite in keeping with the extremely moderate and reasonable disposition that characterizes the patient and layman. You have invaded our benighted contentment and led us out into broad fields of scientific discovery. This has inspired us with a new-born spirit of wisdom and criticism which demands that new and larger fields be opened to our complacent gaze. You have penetrated the places where the germs of disease are hidden. We are quite certain that you should be required to destroy the origin of disease, and ultimately usher in the day when the only escape from the world will be through a passageway marked, "Old Age Exit." If this has the appearance of exacting too much, or if business considerations present obstacles to its accomplishment, I think we ought, perhaps, to reduce our claims, or at least give our doctors time to find other employment

In the meantime those of us who are conservative must be allowed to hope that further investigation will continue to point the way to the prevention of disease. For this investigation we must still rely upon the efforts of those who have already done so much in that direction, encouraged and stimulated by such effective organizations as the Academy of Medicine. We are sure that this work, having arrested the attention of the world's brotherhood of medical science, will not be neglected; nor need we fear that America's contribution to splendid results will be deficient.

In some instances, however, investigation has performed its part, and only effective action in other quarters is necessary to supply needed remedies. In such cases, of course, you are absolved from all responsibility in your professional character by exhibiting dangers and warning against them. Thus certain diseases which you deem contagious yet remain imperfectly isolated. You have demonstrated the peril to health of unwholesome water and noxious surroundings, and yet much remains to be done by way of protecting our people against these dangers. You have established a code of ethics which condemns charlatanism in all its forms, and yet ignorant pretenders roam over the land offering to perform miracles, or are located in our towns and cities, preying upon the weakness of the sick and afflicted, while men and women are allowed to die without medical attendance, deluded with the hope that faith will save them in their last extremity. Within the limits of your professional power and influence you seek to restrain any approach to criminal malpractice, yet newspapers disgustingly, though covertly, advertise the way to such crimes, and startle their readers with sensational tales of death and misery to which they are directly accessory.

I need not suggest that such evils are allowed to exist by reason of the insufficiency of our laws or a laxity in their execution. I have intimated that for this condition you are not responsible in a professional sense; but are you sure that, as citizens, you are doing all in your power to remedy the situation?

The village doctor was not only our physician, but he was a man of influence in all neighborhood affairs. In every matter that concerned the good of the community he was at the front. He was president of

the village or represented his town in the County Board of Supervisors; and if he was ever late in visiting a patient, it was because he lingered at the post office to discuss the political situation. Thus he joined with the performance of professional duty a discharge of the obligations of citizenship.

We cannot but think that the discoveries and improvements in the medical practice which we now enjoy are dearly bought if the members of the profession in their onward march have left behind their sense of civic obligation and their interest in the general public welfare. We cannot accuse you of utter neglect of your duties to the country; and yet we cannot keep out of our mind the suspicion that if your professional work in exposing evils were more thoroughly supplemented by labor in the field of citizenship, these evils would be more speedily corrected.

If laws are needed to abolish abuses which your professional investigations have unearthed, your fraternity should not be strangers to the agencies which make the laws. If enactments already in force are neglected or badly executed, you should not forget that it is your privilege and duty to insist upon their vigorous and honest enforcement. Let me also remind you of the application to your case of the truth embodied in the homely injunction, "If you want a job well done, do it yourself." If members of your profession were oftener found in our national and state legislative assemblies, ready to advocate the reformatory measures you have demonstrated to be necessary and to defend your brotherhood against flippant and sneering charges of impracticability, the prospect of your bestowal upon your fellow-men of the ripened results of your professional labor would be brighter and nearer.

While thus suggesting the need of your influence in legislative circles for the accomplishment of reforms related to your profession, you will, I hope, permit me in conclusion to enjoin upon you the duty of an active and general interest and participation in public affairs for the promotion of your country's good in all its phases. Our government was founded in the faith and anticipation that those who loved it most and were best able to hold it steady would be at its helm. Without this it will surely go astray. Never did patient need your medical treatment more than the body politic now needs the watchful care of your patriotic and disinterested citizenship.

No object of personal ambition and no activity of professional life should be permitted to withhold from our government the tithe of devotion and service due from its thoughtful, intelligent, and educated citizens. The reward of a willing recognition of our obligation to watch and protect our free institutions and preserve them from weakness and decay will surely come when a just government, supported by the patriotism of a loving people, shall bestow with equal hand upon us and all our countrymen the blessings of national peace, contentment and happiness.

SORE THROAT—ITS NATURE—DIFFERENTIATION—INFLUENCE OF CLIMATE AND TREATMENT.*

Dr. J. F. WOODWARD, Norfolk, Va.†

The average man very promptly recognizes any departure of the general system from its normal state, and is so sensitive to abnormalities that in most cases he can render at once a very satisfactory opinion of causes and effect; but when it comes to special senses he will suffer untold discomfort for indefinite periods before a specialist is called in.

To most people "I have a sore throat" conveys no idea whatever of the trouble,

* From the *North Carolina Medical Journal.*

† Late Adjunct Professor of Diseases of Eye, Ear, Nose and Throat in the University College of Medicine, Richmond, Va., etc.

and generally means that there is somewhere in the throat a sore—without an idea as to its location or significance. In point of fact, there seldom occurs such a thing as a sore in the throat as a primary symptom. For in the majority of cases it means only a neuro-arterial change in the superficial mucous membrane with the consequent discomfort, and it is only when it involves the deeper tissues that a real sore results.

Therefore, to the general practitioner this every-day term is of little importance, that is, he does not recognize its usefulness as a symptom or a disease, and looks upon it as a common something, with an unknown cause and of no special importance. This, in my mind is a great misfortune, for in the line of premonitory symptomatology sore throat is an index to a volume of disorders to which we can turn with a great deal of satisfaction to ourselves, and often with benefit to the welfare of our patient's mind and body. It should not be looked upon as a mere matter of "wet feet," as there are many real diseases of the throat that cause pain and discomfort, and these should be differentiated from true sore throat.

Examine closely the mouth, the tongue, and as much of the throat as can well be seen by the use of the tongue depressor, day-light or lamp, and learn the difference between a normal and an abnormal throat —not rest easily satisfied to base the sum and substance of your diagnosis upon a coated tongue and the thermometer reading. Parts most easily seen are just below the level of the uvula, the sides of the pharynx and the tonsils with their anterior and posterior pillars. And you will do well to study in all cases, the changes that precede, accompany, and follow abnormal conditions of the normally slightly reddish mucous membrane, broken into folds and fissures of glandular tissue —interspaced by a network of arteries and veins—dotted with small clear whitish follicles which take an active part in all sore throats—the tonsilla pharyngea. But the uvula, posterior surfaces of the pillars, the intertonsillar spaces, tonsils, base of the tongue and the upper laryngeal mucous membrane are the parts affected in ordinary sore throat.

The symptoms of sore throat are common and known to all of us, but I will give only a list of diseases of the throat and fauces which have all of the symptoms in common with ordinary sore throat, yet are diseases of a graver nature, and when neglected may cause serious trouble. In referring to these symptoms only those characterizing the peculiar nature of the case will be given.

Diphtheria.—After the first stage, pain upon clearing the throat and swallowing.

Acute Follicular Pharyngitis.—Dryness and pricking sensation in throat—later severe pain and swelling.

Acute Follicular Glossitis.—Soreness about ear tubes and radiating throat pains.

Chronic Follicular Glossitis.—Pricking sensation with or without pain on swallowing.

Scrofulous Sore Throat.—In advanced stages there are subjective throat symptoms.

Acute Tubercular Sore Throat.—Severe pain when talking or swallowing.

Syphilitic.—Primary stage with ulceration, pain; secondary, dryness, soreness and pain on swallowing.

Acute and Chronic Inflammatory Edema of Uvula.—Pain and discomfort on eating, drinking, etc.

Leukoplakia Buccalis.—This is a rare disease and symptoms are obscure, but hot foods and drinks cause pain, and pain is constant when fissures occur.

Acute Tonsillitis.—Constitutional symptoms pronounced, also pain and fever.

Phlegmonous Tonsillitis.—Pain on swallowing, mastication, etc.

Hypertrophied Tonsils.—Pain and pricking on talking and swallowing.

Mycoses of Tonsils.—Cause some pain and discomfort.

Cancer of Tonsil.—Pain, severe, while general symptoms are wanting.

Tuberculous Ulceration of Tonsil.—Exceedingly painful on swallowing, while cough may be absent.

Cancer of Pharynx.—Very painful after ulceration sets in, especially on deglutition.

Phæresthesia of Pharynx.—Sense of pin or foreign body in the throat.

Neuralgia of Pharynx.—Pain, same as neuralgia elsewhere.

Disease of Valleculæ of Tongue and

Pyriform Sinuses of Larynx.—Pain and pricking sensation.

The same thing obtains in the more common laryngeal affections. Scalds, burns, irritant drugs etc., cause pain, burning and pricking sensations of throat.

If you have followed me closely, you will see that there are some fifteen or twenty diseases of the throat and fauces that begin and have as their premonitory or accompanying symptoms the different varieties of sore throat. This, while showing the necessity of close observation, leaves us very few manifestations that we can call *pure and simple sore throat;* yet there are such cases whose presence is not alarming and whose treatment ofttimes subjects the patient to unnecessary discomfort.

It is just such cases as these that I wish to bring forward in this paper. And to aid in this, you will find below several interesting cases with symptoms not new and unique whereby a physician might at first sight diagnose the case, but where prompt recognition meant a speedy cure.

Case 1.—L. B. æt. 27—farmer and merchant, present and previous history good as to any signs of a specific taint or diathesis, except he thought that he had had rheumatism; family history excellent—has had what he called trouble on swallowing and sore throat for several years every spring and winter; fleeting pains in the throat severe at times, radiating from about the hyoid bone, exaggerated upon pressure and at times shifting to tongue and neck; slight cough at times but no paroxysm—tonsils, naso-pharynx and uvula normal except slight roseate congestion, turbinate hypertrophy with some rhinitis. This case I diagnosed as a chronic sore throat depending upon a rheumatic diathesis for its peculiar nature. The usual rheumatic treatment with simple oil spray to the throat and nose cured the patient in a few weeks. He of course threw away his gargles, and discards the idea he had received from his family physician that probably he had a tuberculous throat.

Case 2.—J. A. æt 25—negative history, no diathesis; with morphin, whiskey and tobacco habit; acute inflammation of entire mucous membrane of throat and fauces, varix of pharynx, turbinate hypertrophy, etc. This condition would last for a few days and pass off as quickly as it came, showing a decided nervous influence. This was an acute sore throat engrafted upon and exaggerated by the presence of an old chronic pharyngitis. Simple oil spray was all that was needed along with the other treatment for morphin, etc.

Case 3.—S. R., æt. 18—apparently healthy, slim; and family history of tuberculosis, nasal twang, effort to talk, said he had a sense of fullness in throat all the time, and at times hoarseness; pain and hemorrhage as he thought from the lungs; general discomfort. Examination of nose showed hypertrophy of the right middle turbinate; larynx showed general hyperæmia, pharynx and tonsillar pillars slightly congested, base of tongue showed large *lingual tonsils* (varix) rising in folds, sessile and cumulous interfering with the free action of the epiglottis. These were removed with a nasal snare, bent tube. After two weeks the patient was very much improved and in a month was well.

Case 4.—Mr. R., and Mr. S.—two cases who were burnt with chromic acid for turbinate hypertrophy—artificial pharyngitis was produced in both cases upon an old chronic follicular pharyngitis. While they had typical sore throats there was no need of active treatment as they cleared up in a few days under oil spray.

Case 5.—Mr. E. R.—applied to me few days ago saying that he "missed fire" whenever he attempted to reach high notes. While not a robust man his general health was good, he had a history of tuberculosis; a desire to hawk all the time, pharynx dry and glazed and upon the slightest change in the weather his throat becomes sore and painful. He had just what we would expect—"clergyman's" sore throat, (chronic follicular pharyngitis) with slightly elevated, yellow capped follicles here and there over the pharynx whose bases were surrounded by a hyperemic zone which shaded off into a thin and whitish intervening mucous membrane; several very large and tortuous veins starting from one or more of these follicles coursed in a zig-zag manner across the pharnyx losing themselves in the pharyngeal wall; there were seen also muco-purulent strings

of whitish matter hanging from the roof of the pharynx, disorganized naso-pharyngeal secretions. In this case there was no need of treating the sore throat as a simple case of sore throat, but as a chronic follicular pharyngitis. We see such cases as these every day and it is a bad habit to call them all "sore throat," for sore throat is more of a symptom than a disease.

In the *acute fevers* it is almost invariably a precursor, an accompanying symptom depending to a great extent upon the previous condition of the throat for its degree of severity.

There are certain diseases which should never be neglected, for they are diagnostic and characteristic—scarlet fever, diphtheria, small-pox, syphilis, etc.

As you have seen, my paper does not refer to the regular throat diseases, but to an acute inflammation, superficial in nature affecting the superficial mucous membrane of the pharynx palate, tonsils, larynx, base of tongue and fauces.

It is seen most frequently in children and young people, those whose general systems have lost a certain amount of physical resistance, or those suffering from acquired and inherited taints and diatheses.

At first there is a simple hyperemia, then a decided congestion with swelling and pain more or less severe; superficial blood vessels in high state of engorgement which finally involves the muscular and the glandular tissue. This condition appearing as a simple uncomplicated trouble, or engrafting itself upon an already diseased throat, whatever there are found the ordinary causes—exposure in and out of doors, over-use of stimulants of any kind, tobacco, etc., scanty and improper dress—and there is a special proneness when there are found the predisposing diatheses, *i. e.*, scrofulous, syphilitic, neuropathic, lithemic and rheumatic. But there are climatic exciting causes. Sudden, rapid and radical changes in the weather are trying upon the diseases that refer to the mucous membrane. To enjoy the greatest immunity from throat and nasal diseases there is necessary uniform barometric reading, a minium number of rainy days, staple relative humidity, 70 to 80 with an average mean winter temperature of 45 to 55° F., and where the highest mean temperature does not set in until late in the summer and the lowest does not set in until late in the winter. This mild and equable climate allows regular gradation of temperature from summer to winter and *vice versa*, thereby gaining the maximum effect of the sun's rays through the attenuated atmosphere. Excess of moist atmosphere with sudden temperature changes are conducive to nasal, pharyngeal, laryngeal and tonsillar affections.

That the effect of warmth and light upon the skin is to stimulate by reflexes the entire circulatory as well as the nervous system is a well known fact, while Blacker and Clark of London claim that the sunlight is an indispensable factor in climatic cures. Darlington of Arizona proves this, so far as it regards throat troubles, by saying that an excess of moist air and vapor thrown off by the skin and lungs, the mucous membrane of the air passages becomes dry, the rapid evaporation of water leaves a large quantity of mucus behind, this becoming inspissated plugs up the secretory ducts and pharyngitis, rhinitis, tonsillitis and otitis will follow. Rogers of Denver, lays stress upon the point that moist atmosphere is an active agent in propagating the diphtheritic germ. Why should it not as well act favorably toward other germs?

In low-level localities where the atmosphere is above normal all the time the air never becomes so attenuated that the sun's rays produce their full force, and there is a very decided daily variation of temperature 80 to 50° F. Colds and consequent catarrhs and neuralgias are very common. Yet we are blessed in having the salt air with its full per cent. of ozone which is an antiseptic, and also nearness to the sea prevents sudden temperature fall by radiation. Salt air is a well-known antiseptic and if our temperature, humidity and wind pressure remain normal there is no reason why we should have an over-production of colds and catarrhs.

TREATMENT.—It is to the joint efforts of the doctor and the individual himself that we must look for the actual development of a tendency to correct habits. Let not the physician make an aimless appeal to his patient, whose interest in the matter

is not awakened, and even if awakened in many cases he or she will have the inclination to appreciate the high demand for care and discretion—leaving it all to the doctor. As we have seen from the nature of sore throat intelligent instruction from the physician will do more good than all the gargles and lozenges made.

Symptomatic treatment is of special service. If there is found rheumatic, tuberculous, lithemic or any diathesis, treat each individual case as it demands. Direct the patient to wear warm clothing, avoid exposures of all kinds, but do not carry even this to an excess. For the strong and robust a hot bath followed by a cold sponge and a stimulant, but the delicate should avoid taking baths indiscriminately; for them, a warm bath with a rub down is preferable. Stimulant doses of calomel, but not drastic purges; quinin and hot punch, or sucking ice and ice to neck, small doses of tr. aconite and tr. belladonnæ. I do not give the opiates, but instead use codein and the bromids.

The treatment is intended to be palliative throughout. The different diseases of the throat that tend to excite and exaggerate sore throat should be looked after. Avoid the too common use of cocain just because it is immediate in its effects and thereby makes a good impression on your patient; it can be combined with other drugs very successfully.

Demulcent drinks, flax-seed tea, rice water, and sedative lozenges and troches. Potassium chlorate is a very commonly used drug, but it does little or no good locally and should be given internally as a refrigerant diuretic, increasing oxidation, therefore, the amount of urea and uric acid. Cure the cause and not the local manifestation if you would relieve your cases of sore throat.

SOCIETY REPORTS.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated meeting, February 24, 1897.

The president, Dr. James Tyson, in the chair.

DR. W. W. KEEN read a paper entitled:

Resection of the Sternum for Tumors, with the Report of Two Cases, and a Table of Seventeen Previously Reported Cases.

DR. F. X. DERCUM read a paper entitled:

A Brief Outline of the Theory of the Movement of the Neuron as Applied to Normal and Pathologic Mental and Nervous Processes.

DISCUSSION.

DR. S. SOLIS-COHEN considered the theory advanced much more than plausible; it should be termed possible or even probable. For the present it must, however, be regarded rather in the light of a good working hypothesis than as a demonstrated explanation of nervous mechanism. How well it throws light on common mental processes may be seen if one considers his own gropings after the name to be associated with a face that has been recognized—one is almost conscious of the sweep of the processes of the neuron hither, thither, just as one gropes his way in the dark with outstretched moving hands, until the proper connection is made, when, at once, the act of recollection is completed by a definite, satisfying memory; the combination sought has been established and the mind realizes its perfection.

So, too, lecturers seeking the appropriate word, or illustration, or technical term or statistic datum, must be conscious of a process that Dr. Dercum's theory permits one to satisfactorily picture. Again, when one is speaking or writing, words, facts, illustrations at times come slowly and must be sought, caught, dragged into consciousness; at other times ideas and phases come crowding upon one another and the store of illustrations seems inexhaustible; one has a consciousness of force and swing and fulness in his words. How easy it is to picture on the one hand exhausted neurons feebly moving their processes and making few and poor combinations, on the other hand vigorous active neurons reaching out to each other, forming rich and numerous combinations.

Dr. Dercum's explanation of sleep might be extended to some profound problems of psychology. Not alone consciousness, but all existence, is a question of relations. If that which is called *ego* cannot be brought in communicative relation with the external world, that world has for the *ego* no existence. If it cannot be brought into relations of communication

with different domains of the subjective world, to which one is more likely to refer its activity, those domains have no existence for it—there is a contradiction in the very terms. The neurons establish relations of communication in waking hours—of non-communication in sleeping hours. In dreamless sleep communications of the *ego* with the subjective or external world cease—the very relations that give rise to the idea of the *ego* itself are not formed—conscious existence is for the time suspended. It would be interesting to hear Dr. Dercum's explanation of dreams; though doubtless it would follow the suggestions of his remarks as to hypnosis, somnambulism, and the like.

The field is a vast one, but Dr. Dercum's hypothesis makes it possible, at least, to survey it better than it has hitherto been done.

DR. EDWARD JACKSON said that the test of a theory is, how it fits the known facts that it could be expected to have any relation with. One series of facts occurred to Dr. Jackson that seems to fit very well: Ophthalmologists apply certain tests for simulated blindness, as covering the eye that is claimed to be the seeing eye with a lens that, unknown to the person tested, prevents him from seeing with that eye, and he reads letters with the other eye, clearly revealing that he has only pretended blindness. Then there are other cases clearly of the nature of hysterical blindness, that seem to give the same results with these same tests. The patient claims to be blind in one eye, yet, tested in this way, when she believes that she is seeing with the other she reads with the eye that is claimed to be blind. The blindness in these cases is just as genuine as any other manifestation of hysteria. Then there are some cases that seem to carry the matter a step further. Dr. Harlan has reported the case of a man who had an eye injured many years before; and this eye, he had ever since believed, was completely blind. The man came for some irritation or trouble with his other eye, which he had been told, was due to the presence of this blind eye, and he was prepared to have the blind eye removed if that was deemed necessary in order to save the sight of the other. It showed no reason for the blindness. Dr. Harlan tried some of these tests, as that with the convex lens, which was devised by him. He found that the eye that was supposed to be blind had very good sight; and he was readily able to convince the patient that he had good sight in that eye, and the man went away rejoicing that he had two eyes when he thought he only had one.

In the last number of the *American Journal of Medical Sciences*, Dr. Prince, of Boston, records an interesting case. A man was tested, and on covering either eye, the other one showed very imperfect sight. His vision was very greatly impaired, and more on covering one eye than the other. But on allowing him to look with both eyes he saw perfectly. There are many cases of this kind on record in which the patient has had some reason for exaggerating the disability. But this man was seeking a position on the Boston police force, and had been rejected because of his apparently poor vision, the eyes having been tested separately. He had, by this experience, become conscious of the conditions under which he saw poorly.

The physiologic suppression of the sight of one eye is a common experience in the exclusion of one eye, although kept open, in using the microscope. At first, for most persons this is difficult, but experience makes it easy to use it with both eyes open later on. In using the ophthalmoscope the oculist has still more practice in the same thing; all who use the ophthalmoscope usually keep both eyes open, yet they come to have little trouble in ignoring the image formed in the other eye.

All of these facts seem to be closely related; and they seem to be pretty well explained by Dr. Dercum's theory of the mobility of the neuron, which excludes one eye from acts of vision by the cutting off of connections. At times this is entirely under the domain of the will, or is readily influenced by the will; and at times the loss of connection is entirely independent of the will, or possibly independent of any stimulus that can ordinarily be applied to the nervous system. However the facts may be as to the actual movement of the processes, the theory makes a diagram on which knowledge can be arranged that is extremely suggestive.

DR. A. O. J. KELLY said that the theory of the mobility of the neuron, being both new and purely suppositional, is to be accepted with great reservation. Attempting to explain the mental processes of perception, conception and memory upon their supposed dependence upon movements of the neuron, it is of necessity to be inferred that these movements are more or less under the domination of the will. Being, however, personally unacquainted with the histologic basis of the will, Dr. Kelly was interested to know in what manner the will influences the neurons so as to cause them to move. The theory is, nevertheless, most captivating and ingenious, and, offered as it has been by Dr. Dercum in explanation of many normal and pathologic mental and nervous processes, it is entitled to the consideration that is accorded any theory that explains what others fail to. It is thus with essential paroxysmal tachycardia, as Dr. Kelly has lately pointed out.

DR. A. A. ESHNER said that the theory of the mobility of the neuron is a natural and a very happy outcome of recent developments in the histology of the nervous system. As has been stated, the theory is of almost unlimited application, if one chooses to view it in its various aspects. It throws light, among other things, upon the very considerable group of disorders at present designated functional and idiopathic. Qualifications like these are simply delusive cloaks for ignorance, and are calculated to hinder rather than advance true scientific progress. According to the theory so ably expounded by Dr. Dercum, it can be readily understood how nutritional alterations, incapable of demonstration, may give rise to derangement of function,

and, if long maintained, even to structural lesions. Every act of life, during both waking and sleeping hours, is necessarily attended with changes in the nutrition of the nervous system, in the metabolic activity of all its cells, as well, of course, as in the cells of all the organs throughout the body, and this in turn is bound to exercise an immeasurable influence upon function of all kind. So, too as has been suggested with reference to the matter of narcosis, for instance from chloroform, or ether or other general anesthetic. The view has been propounded that the suspension of normal cellular irritability upon which depends the loss of consciousness that results from inhalation of an anesthetic is due to chemic or molecular changes that appear as phenomena of the process of coagulation.* As in sleep, changes take place in the relation of cell-processes and cell-bodies, in consequence of which sensation is first lost, then perception and finally consciousness itself.

DR. JAY F. SCHAMBERG said that the very ingenious theory of the mobility of the neuron would, if viewed in the most comprehensive manner possible, explain almost the entire relation of mind to body and of body to mind. Dr. Dercum has mentioned the normal relation between the cells of the spinal cord and the terminal axons as being one, in all probability, of contact. He has referred to the suspension of this relation as a result of retraction of the axon that occurs in various pathologic conditions, such as hypnotism, hysteria, etc. There is a third possible relation to which he might have referred, viz.: A closer approximation than the normal. This would explain the pathologic intensifications of sensory and motor impulses, and also the hyperacuity of sense-perceptions, such as is often observed in hypnotism.

DR. F. X. DERCUM said that the explanation that suggests itself for dreams is that not all of the neurons are asleep; that, perhaps as a result of disturbed nutrition, or, possibly, of the presence of toxic substances in the blood, some of them are active; but they can only form combinations along lines that have been traveled before. Combinations, no matter how grotesque the dream, are limited by the thoughts and experiences of the waking state.

In answer to the question as to the nature of the will, it may be said in the first place that a subdivision of the mind into the will, the intellect and the emotions, or, in fact, into any other parts, is not acceptable. The mind is an entity which cannot be sub-divided, save from the standpoint of the metaphysician. It is well known that many unicellular and simple multicellular organisms react as if they manifested some form of volition. If, in a sense, volition be a property of simple animal forms, it can be readily understood that a complex aggregate of cells should manifest the same property. The will may be conceived as simply a resultant of the interaction of all of the nerve-cells.

In regard to the suggestion that in hysterical spasm and hysterical catalepsy the nerve-cell processes are more closely approximated Dr. Dercum fully concurred with regard to its probability, and in one or two previous communications on this subject, he has already suggested this idea. It is probable that hysterical hyperesthesia can be explained in the same manner. Hysterical pain, on the other hand, seems to be due to such a combination of the cortical neurons as will give rise to a cortical representation of pain; the pain is referred, as is well known, to a joint, a portion of the surface or some special structure. In other words, hysterical pain is a "pain hallucination." Dr. Dercum thoroughly concurred with the view in regard to the value of the theory here advanced in explaining many functional nervous diseases, and also with the interpretation of the phenomena described by Dr. Jackson.

DR. G. HUDSON MAKUEN exhibited

"A Case of Speech-Defect."

occuring in a boy fifteen years old, of good intelligence and well advanced in school, whose speech, in consequence of illness and want of training in early childhood, was so defective as to be quite unintelligible. After four weeks of training at the clinic for speech-defects of the Philadelphia Polyclinic, the boy became able to articulate distinctly quite a considerable number of short words, and Dr. Makuen expressed confidence, from the progress already made, that he would in a short time be able to speak as well as any one.

DR. S. SOLIS-COHEN asked if the boy's parents were German, as for an American he spoke with a decided foreign accent. If not, the explanation must be sought in the fact that English, as spoken by others, is a foreign language to him. Dr. Cohen suggested that it would be interesting to compare the imperfect record of speech by phonograph at a later date with the progress made.

DR. G. HUDSON MAKUEN said that he had arranged to take a record of the boy's speech in a phonograph. This instrument is not altogether satisfactory, because, in order to get a clear reproduction, it is necessary to speak unnaturally loud, and the effort to do this oftentimes destroys the very peculiarity of speech that it is desired to record. The dialect is purely local, for the patient and his ancestors for two generations were born in Philadelphia.

MONEY never made a man happy yet, nor will it. There is nothing in its nature to produce happiness. The more a man has, the more he wants. Instead of its filling a vacuum, it makes one. If it satisfies one want, it doubles and troubles that want another way. That was a true proverb of the wise man, rely upon it: "Better is little with the fear of the Lord, than great treasure and trouble therewith." —*Franklin.*

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* *Medical News*, Jan. 14, 1893, p. 49.